


DRB100

RELIABILITY DATA

信頼性データ

DWG No. CA801-57-01		
APPD	CHK	DWG
 4/Jul/13	Roger 2/Jul/13	Adolph W... 3/Jul/13

INDEX

	PAGE
1. MTBF計算値 Calculated Values of MTBF	R-1
2. 部品ディレーティング Component Derating	R-2~4
3. 主要部品温度上昇値 Main Components Temperature Rise ΔT List	R-5~6
4. 電解コンデンサ推定寿命計算値 Electrolytic Capacitor Lifetime	R-7
5. アブノーマル試験 Abnormal Test	R-8~12
6. 振動試験 Vibration Test	R-13
7. ノイズシミュレート試験 Noise Simulate Test	R-14
8. 熱衝撃試験 Thermal Shock Test	R-15
9. 電圧ディップ、瞬停イミュニティ試験	R-16
Voltage Dips, Short Interruptions Immunity Test (SEMI-F47)	

※ 試験結果は、代表データであります。全ての製品はほぼ同等な特性を示します。
従いまして、以下の結果は実力値とお考え願います。

Test results are typical data. Nevertheless the following results are considered to be actual capability data because all units have nearly the same characteristics.

1. MTBF計算値 Calculated Values of MTBF

MODEL : DRB100-24-1

(1) 算出方法 Calculating Method

JEITA (RCR-9102B)の部品点数法で算出されています。
 それぞれの部品ごとに、部品故障率 λ_G が与えられ、各々の点数によって決定されます。
 Calculated based on part count reliability projection of JEITA (RCR-9102B).
 Individual failure rates λ_G is given to each part and MTBF is calculated
 by the count of each part.

<算出式>

$$MTBF = \frac{1}{\lambda_{equip}} = \frac{1}{\sum_{i=1}^n n_i (\lambda_G \pi_Q)_i} \times 10^6 \text{ 時間(Hours)}$$

λ_{equip} : 全機器故障率 (故障数/10⁶時間)
 Total Equipment Failure Rate (Failure/10⁶Hours)

λ_G : i 番目の同属部品に対する故障率 (故障数/10⁶時間)
 Generic Failure Rate for The ith Generic Part (Failure/10⁶Hours)

n_i : i 番目の同属部品の個数
 Quantity of ith Generic Part

n : 異なった同属部品のカテゴリーの数
 Number of Different Generic Part Categories

π_Q : i 番目の同属部品に対する品質ファクタ ($\pi_Q=1$)
 Generic Quality Factor for The ith Generic Part ($\pi_Q=1$)

(2) MTBF値 MTBF Values

G_F : 地上固定 (Ground, Fixed)

RCR-9102B

MTBF ≒ 210505 時間 (Hours)

2. 部品デイレートイング Components Derating

MODEL : DRB100-24-1

(1) 算出方法 Calculating Method

(a) 測定方法 Measuring method

・取付方法 Mounting method	: 標準取付 Standard mounting	・周囲温度 Ambient temperature	: 55°C
・入力電圧 Input voltage	: 115, 230VAC	・出力電圧、電流 Output voltage & current	: 100%

(b) 半導体 Semiconductors

ケース温度、消費電力、熱抵抗より使用状態の接合点温度を求め
最大定格、接合点温度との比較を求めました。

Compared with maximum junction temperature and actual one which is calculated
based on case temperature, power dissipation and thermal impedance.

(c) IC、抵抗、コンデンサ等 IC, Resistors, Capacitors, etc.

周囲温度、使用状態、消費電力など、個々の値は設計基準内に入っています。

Ambient temperature, operating condition, power dissipation and so on are within
derating criteria.

(d) 熱抵抗算出方法 Calculating method of thermal impedance

$$\theta_{j-c} = \frac{T_j(\max) - T_c}{P_{ch}(\max)} \quad \theta_{j-a} = \frac{T_j(\max) - T_a}{P_{ch}(\max)} \quad \theta_{j-l} = \frac{T_j(\max) - T_l}{P_{ch}(\max)}$$

Tc : デイレートイングの始まるケース温度 一般に25°C
Case Temperature at Start Point of Derating; 25°C in General

Ta : デイレートイングの始まる周囲温度 一般に25°C
Ambient Temperature at Start Point of Derating; 25°C in General

Tl : デイレートイングの始まるリード温度 一般に25°C
Lead Temperature at Start Point of Derating; 25°C in General

Pch(max) : 最大チャネル損失
Maximum Channel Dissipation

Tj(max) : 最大接合点(チャネル)温度
(Tch(max)) Maximum Junction (channel) Temperature

θ_{j-c} : 接合点(チャネル)からケースまでの熱抵抗
(θ_{ch-c}) Thermal Impedance between Junction (channel) and Case

θ_{j-a} : 接合点から周囲までの熱抵抗
Thermal Impedance between Junction and air

θ_{j-l} : 接合点からリードまでの熱抵抗
Thermal Impedance between Junction and Lead

(2) 部品ダイレーティング表 Component Derating List

Model: DRB100-24-1

部品番号 Location No.	Vin = 115VAC Ta = 55°C Load = 100%(Vo: 24V, Io: 4.2A)		
A101 L6564DTR ST MICRO	Tj (max) = 150 °C Pt = 59.7 mW Tj = Ta + ((θj-a) × Pt) = 105.8°C D.F. = 70.51%	θj-a = 120.0 °C/W ΔTa = 43.6°C	Pt (max) = 0.75 W Ta = 98.6 °C
A102 L6566ATR ST MICRO	Tj (max) = 150 °C Pt = 126.0 mW Tj = Ta + ((θj-a) × Pt) = 104.0°C D.F. = 69.35%	θj-a = 120.0 °C/W ΔTa = 33.9°C	Pt(max) = 0.75 W Ta = 88.9 °C
A201 UPC1093T-E1-AZ RENESAS	Ta (max) = 85 °C Pt = 14.9 mW Pmax = Pt(max) + (Ta - 25°C) × ΔPc/°C = 226.6mW D.F. = 6.58%	ΔPc/°C = -3.2mW/°C (Ta>25°C) ΔTa = 24.2°C	Pt(max) = 0.4 W Ta = 79.2 °C
Q1 IPA60R199CP INFINEON	Tch (max) = 150 °C Pd = 1.5 W Tch = Tc + ((θch-c) × Pd) = 97.4°C D.F. = 64.9%	θch-c = 3.7 °C/W ΔTc = 36.8°C	Pd (max) = 34.0 W Tc = 91.8 °C
Q2 TK8A65D(Q) TOSHIBA	Tch (max) = 150 °C Pd = 1.54 W Tch = Tc + ((θch-c) × Pd) = 122.8°C D.F. = 81.85%	θch-c = 2.78 °C/W ΔTc = 63.5°C	Pd (max) = 45.0 W Tc = 118.5 °C
D1 RS405M RECTRON	Tj (max) = 150 °C Pd = 2.95 W Tj = Tc + ((θj-c) × Pd) = 116.5°C D.F. = 77.67%	θj-c = 6.0 °C/W ΔTc = 43.8°C	Tc = 98.8 °C
D51 STPS30150CW ST MICRO	Tj (max) = 175 °C Pd = 3.15 W Tj = Tc + ((θj-c) × Pd) = 125.2°C D.F. = 71.55%	θj-c = 0.8 °C/W ΔTc = 67.7°C	Tc = 122.7 °C
D103 DE5L60U-7061 SHINDENGEN	Tj (max) = 150 °C Pd = 0.54 W Tj = Tc + ((θj-c) × Pd) = 99.6°C D.F. = 66.4%	θj-c = 4.0 °C/W ΔTc = 44.6°C	Tc = 99.6 °C
D106 D1F60-5053 SHINDENGEN	Tj (max) = 150 °C Pd = 8.0 mW Tj = Ta + ((θj-a) × Pd) = 116.9°C D.F. = 77.9%	θj-a = 157.0 °C/W ΔTa = 60.6°C	Ta = 115.6 °C
PC101 PS2861B-1Y-F3-A(L) (TRANSISTOR) RENESAS	Ta (max) = 110 °C Pc = 2.0 mW Pmax = Pc(max) + (Ta - 25°C) × ΔPc/°C = 35.4mW D.F. = 5.65%	ΔPc/°C = -1.2mW/°C (Ta>25°C) ΔTa = 40.5°C	Pc(max) = 120.0 mW Ta = 95.5 °C
PC101 PS2861B-1Y-F3-A(L) (LED) RENESAS	Ta (max) = 110 °C Pd = 1.0 mW Pmax = Pd(max) + (Ta - 25°C) × ΔPd/°C = 17.7mW D.F. = 5.65%	ΔPd/°C = -0.6mW/°C (Ta>25°C) ΔTa = 40.5°C	Pd(max) = 60.0 mW Ta = 95.5 °C
PC102 PS2861B-1Y-F3-A(L) (TRANSISTOR) RENESAS	Ta (max) = 110 °C Pc = 0.0 mW Pmax = Pc(max) + (Ta - 25°C) × ΔPc/°C = 31.1mW D.F. = 0.0%	ΔPc/°C = -1.2mW/°C (Ta>25°C) ΔTa = 44.1°C	Pc(max) = 120.0 mW Ta = 99.1 °C
PC102 PS2861B-1Y-F3-A(L) (LED) RENESAS	Ta (max) = 110 °C Pd = 0.0 mW Pmax = Pd(max) + (Ta - 25°C) × ΔPd/°C = 15.5mW D.F. = 0.0%	ΔPd/°C = -0.6mW/°C (Ta>25°C) ΔTa = 44.1°C	Pd(max) = 60.0 mW Ta = 99.1 °C

(2) 部品デレーティング表 Component Derating List

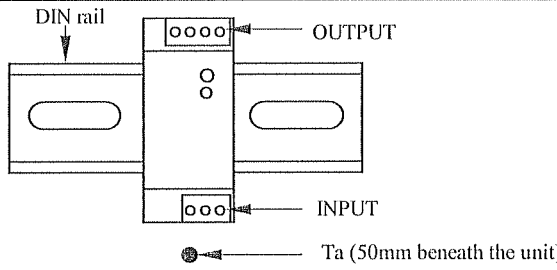
Model: DRB100-24-1

部品番号 Location No.	Vin = 230VAC Ta = 55°C Load = 100%(Vo: 24V, Io: 4.2A)		
A101 L6564DTR ST MICRO	Tj (max) = 150 °C Pt = 109.9 mW Tj = Ta + ((θj-a) × Pt) = 106.2°C D.F. = 70.79%	θj-a = 120.0 °C/W ΔTa = 38.0°C	Pt (max) = 0.75 W Ta = 93.0 °C
A102 L6566ATR ST MICRO	Tj (max) = 150 °C Pt = 122.9 mW Tj = Ta + ((θj-a) × Pt) = 100.2°C D.F. = 66.83%	θj-a = 120.0 °C/W ΔTa = 30.5°C	Pt(max) = 0.75 W Ta = 85.5 °C
A201 UPC1093T-E1-AZ RENESAS	Ta (max) = 85 °C Pt = 14.9 mW Pmax = Pt(max) + (Ta - 25°C) × ΔPc/°C = 236.5mW D.F. = 6.3%	ΔPc/°C = -3.2mW/°C (Ta>25°C) ΔTa = 21.1°C	Pt(max) = 0.4 W Ta = 76.1 °C
Q1 IPA60R199CP INFINEON	Tch (max) = 150 °C Pd = 0.8 W Tch = Tc + ((θch-c) × Pd) = 94.6°C D.F. = 63.04%	θch-c = 3.7 °C/W ΔTc = 36.6°C	Pd (max) = 34.0 W Tc = 91.6 °C
Q2 TK8A65D(Q) TOSHIBA	Tch (max) = 150 °C Pd = 1.54 W Tch = Tc + ((θch-c) × Pd) = 118.5°C D.F. = 78.99%	θch-c = 2.78 °C/W ΔTc = 59.2°C	Pd (max) = 45.0 W Tc = 114.2 °C
D1 RS405M RECTRON	Tj (max) = 150 °C Pd = 0.76 W Tj = Tc + ((θj-c) × Pd) = 84.4°C D.F. = 56.24%	θj-c = 6.0 °C/W ΔTc = 24.8°C	Tc = 79.8 °C
D51 STPS30150CW ST MICRO	Tj (max) = 175 °C Pd = 3.15 W Tj = Tc + ((θj-c) × Pd) = 120.6°C D.F. = 68.93%	θj-c = 0.8 °C/W ΔTc = 63.1°C	Tc = 118.1 °C
D103 DE5L60U-7061 SHINDENGEN	Tj (max) = 150 °C Pd = 0.54 W Tj = Tc + ((θj-c) × Pd) = 90.3°C D.F. = 60.2%	θj-c = 4.0 °C/W ΔTc = 35.3°C	Tc = 90.3 °C
D106 D1F60-5053 SHINDENGEN	Tj (max) = 150 °C Pd = 8.0 mW Tj = Ta + ((θj-a) × Pd) = 112.6°C D.F. = 75.04%	θj-a = 157.0 °C/W ΔTa = 56.3°C	Ta = 111.3 °C
PC101 PS2861B-1Y-F3-A(L) (TRANSISTOR) RENESAS	Ta (max) = 110 °C Pc = 2.0 mW Pmax = Pc(max) + (Ta - 25°C) × ΔPc/°C = 40.4mW D.F. = 4.95%	ΔPc/°C = -1.2mW/°C (Ta>25°C) ΔTa = 36.3°C	Pc(max) = 120.0 mW Ta = 91.3 °C
PC101 PS2861B-1Y-F3-A(L) (LED) RENESAS	Ta (max) = 110 °C Pd = 1.0 mW Pmax = Pd(max) + (Ta - 25°C) × ΔPd/°C = 20.2mW D.F. = 4.95%	ΔPd/°C = -0.6mW/°C (Ta>25°C) ΔTa = 36.3°C	Pd(max) = 60.0 mW Ta = 91.3 °C
PC102 PS2861B-1Y-F3-A(L) (TRANSISTOR) RENESAS	Ta (max) = 110 °C Pc = 0.0 mW Pmax = Pc(max) + (Ta - 25°C) × ΔPc/°C = 35.8mW D.F. = 0.0%	ΔPc/°C = -1.2mW/°C (Ta>25°C) ΔTa = 40.2°C	Pc(max) = 120.0 mW Ta = 95.2 °C
PC102 PS2861B-1Y-F3-A(L) (LED) RENESAS	Ta (max) = 110 °C Pd = 0.0 mW Pmax = Pd(max) + (Ta - 25°C) × ΔPd/°C = 17.9mW D.F. = 0.0%	ΔPd/°C = -0.6mW/°C (Ta>25°C) ΔTa = 40.2°C	Pd(max) = 60.0 mW Ta = 95.2 °C

3. 主要部品温度上昇値 Main Components Temperature Rise ΔT List

MODEL : DRB100-24-1

(1) 測定条件 Measuring Conditions

取付方法 Mounting Method (標準取付) (Standard Mounting)	Standard Mounting
	
入力電圧 V_{in} Input Voltage	115VAC
出力電圧 V_o Output Voltage	24VDC
出力電流 I_o Output Current	4.2A(100%)

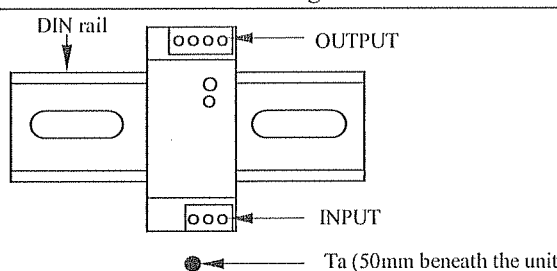
(2) 測定結果 Measuring Results

出力デレーティング Output Derating		ΔT Temperature Rise ($^{\circ}C$)	
		Io=100 %	
部品番号 Location No.		部品名 Part name	
		取付方向 Standard Mounting	
		24VDC	
A101	CHIP IC	43.6	
A102	CHIP IC	33.9	
C7	E.CAP.	36.3	
C8	E.CAP.	45.6	
C51	E.CAP.	42.2	
C52	E.CAP.	38.3	
C53	E.CAP.	23.8	
D1	BRIDGE DIODE	43.8	
D51	S.B.D	67.7	
D103	CHIP DOIDE	44.6	
D106	CHIP DOIDE	60.6	
L1	CHOCK COIL	15.6	
L2	BALUN COIL	35.8	
L3	CHOCK COIL	44.3	
L51	CHOCK COIL	49.2	
L52	BALUN COIL	33.0	
Q1	PFC MOSFET	36.8	
Q2	DC/DC MOSFET	63.5	
PC101	PHOTO COUPLER	40.5	
PC102	PHOTO COUPLER	44.1	
T1	TRANSFORMER	69.3	

3. 主要部品温度上昇値 Main Components Temperature Rise ΔT List

MODEL : DRB100-24-1

(1) 測定条件 Measuring Conditions

取付方法 Mounting Method (標準取付) (Standard Mounting)	Standard Mounting	
		
入力電圧 V_{in} Input Voltage	230VAC	
出力電圧 V_o Output Voltage	24VDC	
出力電流 I_o Output Current	4.2A(100%)	

(2) 測定結果 Measuring Results

出力デレーティング Output Derating		ΔT Temperature Rise ($^{\circ}\text{C}$)	
		Io=100 %	
部品番号 Location No.		部品名 Part name	
		取付方向 Standard Mounting	
		24VDC	
A101	CHIP IC	38.0	
A102	CHIP IC	30.5	
C7	E.CAP.	31.5	
C8	E.CAP.	40.4	
C51	E.CAP.	37.8	
C52	E.CAP.	33.0	
C53	E.CAP.	21.0	
D1	BRIDGE DIODE	24.8	
D51	S.B.D	63.1	
D103	CHIP DOIDE	35.3	
D106	CHIP DOIDE	56.3	
L1	CHOCK COIL	11.2	
L2	BALUN COIL	16.9	
L3	CHOCK COIL	32.1	
L51	CHOCK COIL	43.3	
L52	BALUN COIL	29.6	
Q1	PFC MOSFET	36.6	
Q2	DC/DC MOSFET	59.2	
PC101	PHOTO COUPLER	36.3	
PC102	PHOTO COUPLER	40.2	
T1	TRANSFORMER	63.8	

4. 電解コンデンサ推定寿命計算値 Electrolytic Capacitor Lifetime

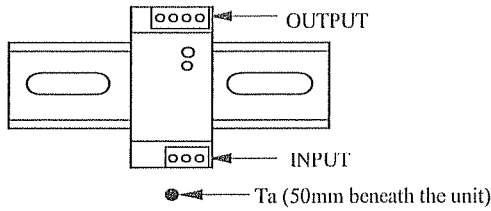
MODEL : DRB100-24-1

空冷条件 : 自然空冷

Cooling condition : Convection cooling

標準取付

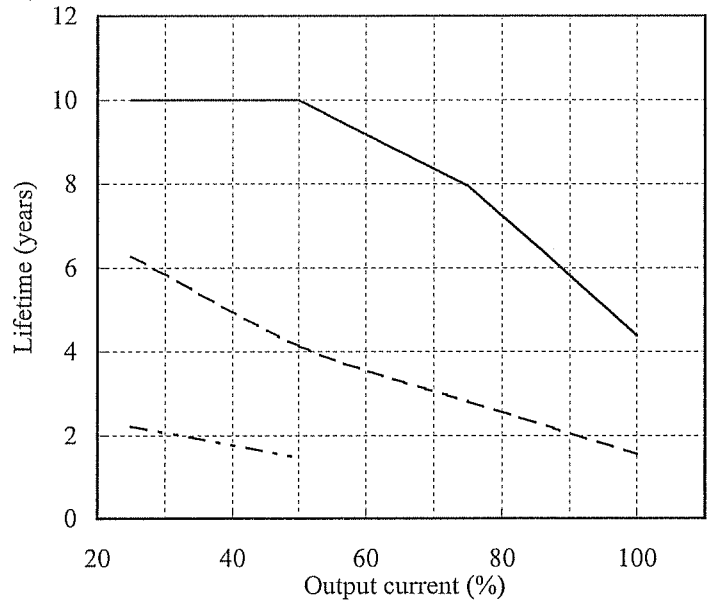
Standard Mounting



Conditions T_a 40°C : ———
 55°C : - - - -
 70°C : - · - · -

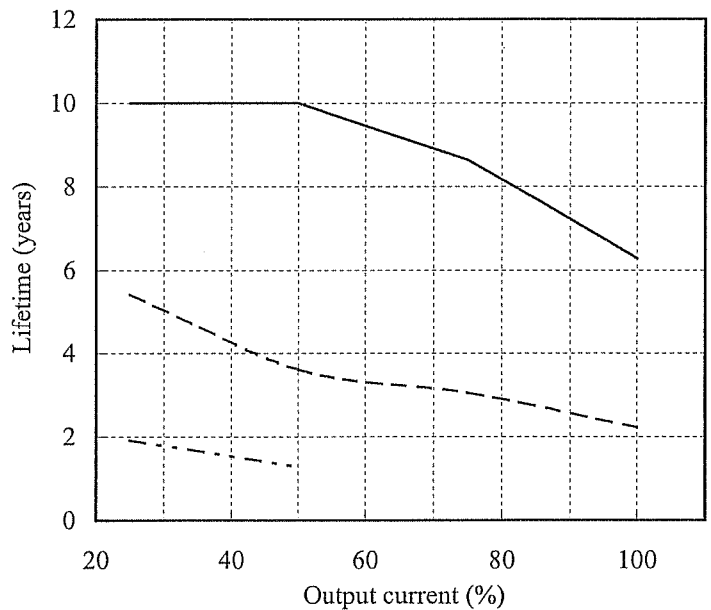
$V_{in}=115VAC$

Load (%)	Lifetime (years)		
	$T_a=40^{\circ}C$	$T_a=55^{\circ}C$	$T_a=70^{\circ}C$
25	10.0	6.3	2.2
50	10.0	4.1	1.5
75	8.0	2.8	-
100	4.4	1.6	-



$V_{in}=230VAC$

Load (%)	Lifetime (years)		
	$T_a=40^{\circ}C$	$T_a=55^{\circ}C$	$T_a=70^{\circ}C$
25	10.0	5.4	1.9
50	10.0	3.6	1.3
75	8.6	3.1	-
100	6.3	2.2	-



5. アブノーマル試験 Abnormal Test

MODEL :DRB100-24-1

(1) 試験条件 Test Conditions

Input : 230VAC Output : 24V, 4.2A Ta : 25°C

(2) 試験結果 Test Results

(Da : Damaged)

No.	Test position		Test mode		Test result											記事 Note		
	部品No. Location No.	試験端子 Test point	ショート Short	オープン Open	a 発火 Fire	b 発煙 Smoke	c 破裂 Burst	d 異臭 Smell	e 赤熱 Red hot	f 破損 Damaged	g ヒューズ断 Fuse blown	h OVP	i OCP	j 出力断 No output	k 変化なし No change		l その他 Others	
1	D1	AC-AC	O							O	O			O			Da:F1	
2		DC-DC	O							O	O			O			Da:F1	
3		AC-DC	O							O	O			O			Da:F1	
4		AC		O											O			
5		DC		O											O			
6	Q1	D-S	O							O	O			O			Da:F1,R107,R108,Z101	
7		D-G	O							O	O			O			Da:F1,R107,R108,Z101,Q1,A101,A102	
8		G-S	O													O	PF reduced from 0.98 to 0.56	
9		D		O												O	PF reduced from 0.98 to 0.56	
10		S		O												O	PF reduced from 0.98 to 0.56	
11	G		O							O	O			O			Da:F1,R107,R108,Z101,Q1	
12	Q2	D-S	O							O	O			O			Da:F1,R115,R116,Z103	
13		D-G	O							O	O			O			Da:F1,R115,R116,Z103,Z102,A102	
14		G-S	O												O			
15		D		O											O			
16		S		O											O			
17	G		O							O				O			Da:F1,R115,R116,Z103,Q2	
18	Q102	B-C	O												O		Da:R150,Z104	
19		C-E	O													O	Input power increase 1.5W	
20		E-B	O												O			
21		B		O											O			
22		C		O											O			
23	E		O											O				
24	D51	A-K	O											O				
25		A		O											O			
26		K		O											O			
27	D101	A-K	O													O	PF reduced from 0.98 to 0.47	
28		A,K		O											O			
29	D103	A-K	O													O	Input power increase 3W	
30		A,K		O						O				O			Da:F1,R107,R108,Z101,Q1	
31	D104	A-K	O												O			
32		A,K		O											O			
33	D105	A-K	O												O			
34		A,K		O												O	Input power increase 1.5W	
35	D106	A-K	O											O				
36		A,K		O											O			

(Da : Damaged)

No.	Test position		Test mode		Test result											記事 Note	
	部品No.	試験端子	ショート	オープン	a	b	c	d	e	f	g	h	i	j	k		l
	Location No.	Test point	Short	Open	発火 Fire	発煙 Smoke	破裂 Burst	異臭 Smell	赤熱 Red hot	破損 Damaged	ヒューズ断 Fuse blown	OVP	OCP	出力断 No output	変化なし No change	その他 Others	
37	D108	A-K	O												O	Turn on P/S no output	
38		A,K		O												O	OCP auto-restart malfunction(latch)
39	D109	A-K	O											O			
40		A,K		O										O			
41	D110	A-K	O													O	Da: R150
42		A,K		O												O	
43	D111	A-K	O													O	
44		A,K		O												O	
45	D201	A-K	O													O	
46		A,K		O												O	
47	D202	A-K	O													O	
48		A,K		O												O	
49	T1	1-3	O											O			
50		3-4	O							O	O			O			Da:F1
51		4-5	O											O			
52		5-6	O											O			
53		9-10	O											O			
54		1		O											O		
55		3		O											O		Hiccup
56		4		O											O		Hiccup
57		5		O											O		
58		6		O												O	
59		8		O												O	
60		9		O												O	
61		10		O												O	
62		11		O												O	
63	L3	1-9	O													O	Input power increase 3.5W, PF reduced from 0.98 to 0.54
64		4-5	O													O	Input power increase 3.5W, PF reduced from 0.98 to 0.54
65		1,9		O												O	PF reduced from 0.98 to 0.55
66		4,5		O												O	PF reduced from 0.98 to 0.55
67	L51	1-2	O													O	
68		1,2		O												O	
69	L52	1-2	O													O	
70		3-4	O													O	
71		1-3	O											O			Hiccup
72		2-4	O											O			Hiccup
73		1,2		O												O	
74		3,4		O												O	

(Da : Damaged)

No.	Test position		Test mode		Test result											記事 Note
	部品No.	試験端子	ショート	オープン	a	b	c	d	e	f	g	h	i	j	k	
	Location No.	Test point	Short	Open	発火 Fire	発煙 Smoke	破裂 Burst	異臭 Smell	赤熱 Red hot	破損 Damaged	ヒューズ断 Fuse blown	OVP	OPP	出力断 No output	変化なし No change	その他 Others
75	PC101	1-2	O									O		O		
76		3-4	O											O		
77		1,2		O								O		O		
78		3,4		O								O		O		
79	PC102	1-2	O												O	OVP malfunction
80		3-4	O									O		O		
81		1,2		O											O	OVP malfunction
82		3,4		O											O	OVP malfunction
83	A101	1-2	O													O P/S has noise
84		2-3	O													O PF reduced from 0.98 to 0.56
85		3-4	O													O PF reduced from 0.98 to 0.56
86		4-5	O													O PF reduced from 0.98 to 0.56
87		6-7	O													O PF reduced from 0.98 to 0.7,P/S has noise
88		7-8	O													O PF reduced from 0.98 to 0.47,P/S has noise
89		8-9														O PF reduced from 0.98 to 0.56
90		9-10	O													O PF reduced from 0.98 to 0.56
91		1-8		O												O PF reduced from 0.98 to 0.56
92		3-8		O												O PF reduced from 0.98 to 0.56
93		4-8		O							O	O		O		Da:F1,R107,R108,Z101,Q1
94		5-8		O												O PF reduced from 0.98 to 0.56
95		6-8		O												O PF reduced from 0.98 to 0.56
96		8-10	O												O	Da:A102
97		1		O												O PF reduced from 0.98 to 0.55
98		2		O												O PF reduced from 0.98 to 0.37,P/S has noise
99		3		O												O PF reduced from 0.98 to 0.55
100		4		O							O	O		O		Da:F1,R107,R108,Z101,Q1
101		5		O												O PF reduced from 0.98 to 0.93
102		6		O												O PF reduced from 0.98 to 0.56
103	7		O												O PF reduced from 0.98 to 0.56	
104	8		O												O PF reduced from 0.98 to 0.56	
105	9		O												O PF reduced from 0.98 to 0.56	
106	10		O												O PF reduced from 0.98 to 0.56	
107	A201	1-2	O													O Vo=1.1V ,Pin=10.68W
108		2-3	O									O		O		
109		1		O								O		O		
110		2		O								O		O		
111		3		O								O		O		

(Da : Damaged)

No.	Test position		Test mode		Test result											記事 Note	
	部品No.	試験端子	ショート	オープン	a	b	c	d	e	f	g	h	i	j	k		l
	Location No.	Test point	Short	Open	発火	発煙	破裂	異臭	赤熱	破損	ヒューズ断	OVP	OCP	出力断	変化なし	その他	
					Fire	Smoke	Burst	Smell	Red hot	Damaged	Fuse blown			No output	No change	Others	
112	A102	1-2	O												O		
113		2-3	O												O		
114		3-4	O												O		
115		4-5	O								O	O			O		Da:F1,R115,R116,Z103,Q2
116		5-6	O												O		VCC-PFC can't be controlled
117		6-7	O												O		
118		7-8	O										O		O		
119		9-10	O												O		P/S latch off
120		10-11	O												O		P/S latch off
121		11-12	O												O		P/S latch off
122		12-13	O													O	
123		13-14	O													O	
124		14-15	O												O		Hiccup
125		15-16	O												O		Hiccup
126		3-5	O												O		Da:A102
127		3-6	O												O		
128		3-7	O									O	O		O		Da:F1,R115,R116,Z103,Q2
129		3-8	O												O		OVP malfunction
130		3-9	O												O		Hiccup
131		3-10	O												O		
132		3-11	O											O	O		Hiccup
133		3-12	O												O		
134		3-13	O												O		
135		3-14	O												O		Hiccup
136		3-15	O												O		
137		3-16	O												O		
138		1		O												O	
139		2		O												O	
140		3		O												O	
141		4		O											O		
142		5		O											O		Hiccup
143		6		O											O		
144		7		O											O		
145		8		O											O		OVP malfunction
146		9		O									O		O		
147		10		O											O		
148	11		O									O		O			
149	12		O											O		QR mode ==> FF mode	
150	13		O											O			
151	14		O											O			
152	15		O											O			
153	16		O											O			

(Da : Damaged)

No.	Test position		Test mode		Test result											記事 Note	
	部品No.	試験端子	ショート	オープン	a	b	c	d	e	f	g	h	i	j	k		l
					発火	発煙	破裂	異臭	赤熱	破損	ヒューズ断	OVP	OCP	出力断	変化なし		その他
Location No.	Test point	Short	Open	Fire	Smoke	Burst	Smell	Red hot	Damaged	Fuse blown			No output	No change	Others		
154	C7	-	O							O				O		Da:F1	
155		-	O													O Hiccup	
156	C8	-	O											O			
157		-	O											O			
158	C51	-	O											O		Hiccup	
159		-	O												O	Ripple higher	
160	C52	-	O											O		Hiccup	
161		-	O												O	Ripple higher	
162	C53	-	O											O		Hiccup	
163		-	O												O	Ripple higher	
164	C101	-	O												O		
165		-	O												O		
166	C120	-	O												O		
167		-	O												O		
168	C122	-	O												O		
169		-	O												O		
170	C124	-	O												O		
171		-	O												O		
172	C201	-	O											O			
173		-	O												O		
174	C210	-	O												O		
175		-	O												O		
176	R51	-	O												O		
177		-	O												O		

6. 振動試験 Vibration Test

MODEL : DRB100-24-1

(1) 振動試験種類 Vibration Test Class

掃引振動数耐久試験 Frequency variable endurance test

(2) 使用振動試験装置 Equipment Used

・制御部 : DP550
Controller DP CORP USA

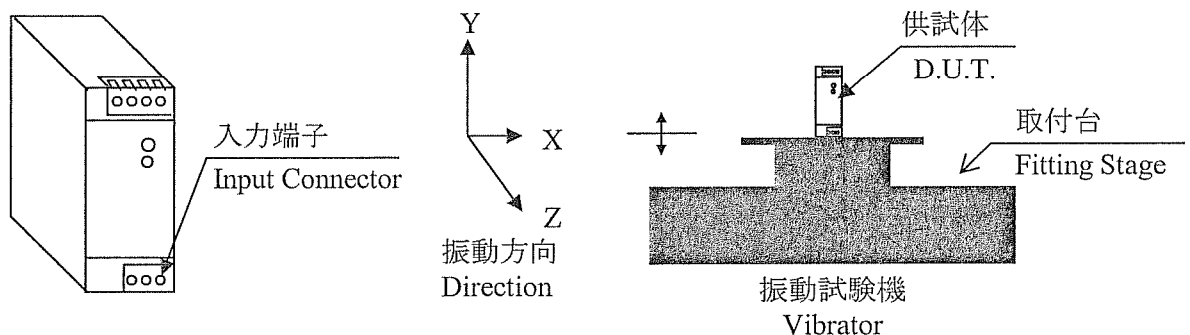
・加振部 : V870
Vibrator LDS CORP. UK

(3) 試験条件 Test Conditions

・周波数範囲 : 10~55Hz
Sweep frequency
・掃引時間 : 1.0分間
Sweep time 1.0min
・加速度 : 一定 19.6m/s^2 (2G)
Acceleration Constant

・振動方向 : X, Y, Z
Direction
・試験時間 : 各方向共 1時間
Sweep count 1 hour each

(4) 試験方法 Test Method



(5) 判定条件 Judging Conditions

- 1.破壊しない事
Not to be broken
- 2.試験後の特性は初期値から変動していない事
Characteristic to be within regulation specification after the test.

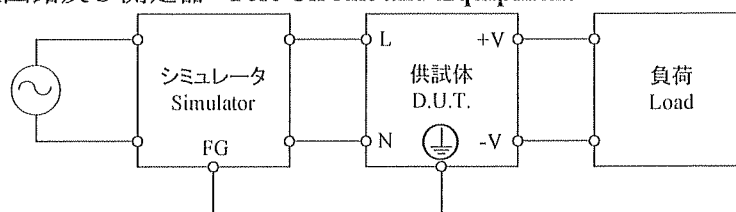
(6) 試験結果 Test Results

合格 OK

7. ノイズシミュレート試験 Noise Simulate Test

MODEL : DRB100-24-1

(1) 試験回路及び測定器 Test Circuit and Equipment



シミュレータ : INS-400L (ノイズ研究所)
 Simulator : (Noise Laboratory Co.,LTD)

(2) 試験条件 Test Conditions

・入力電圧 Input voltage	: 115, 230VAC	・ノイズ電圧 Noise level	: 0~2kV
・出力電圧 Output Voltage	: 定格 Rated	・位相 Phase	: 0~360 deg
・出力電流 Output current	: 0, 100%	・極性 Polarity	: +, -
・周囲温度 Ambient temperature	: 25°C	・印加モード Mode	: コモン、ノーマル Common, Normal
・パルス幅 Pulse width	: 50~1000ns	・トリガ選択 Trigger select	: Line

(3) 判定条件 Judging Conditions

- 1.破壊しない事
Not to be broken
- 2.出力がダウンしない事
Not to be shut down output
- 3.その他異常のない事
No other out of orders

(4) 試験結果 Test Results

合格 OK

8. 熱衝撃試験 Thermal Shock Test

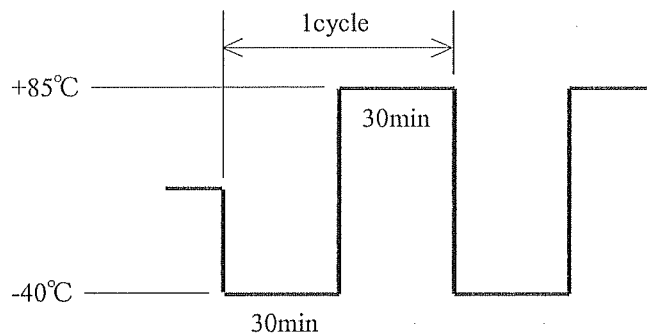
MODEL : DRB100-24-1

(1) 使用計測器 Equipment Used

TSA-101S-W : ESPEC

(2) 試験条件 Test Conditions

- ・電源周囲温度 : -40°C ⇔ 85°C
Ambient Temperature
- ・試験時間 : 図参照
Test Time Refer to Dwg.
- ・試験サイクル : 100 サイクル
Test Cycle 100 Cycles
- ・非動作
Not Operating



(3) 試験方法 Test Method

初期測定の後、供試品を試験槽に入れ、上記サイクルで試験を行う。100サイクル後に、供試品を常温常湿下に1時間放置し、出力に異常がない事を確認する。

Before testing, check if there is no abnormal output, then put the D.U.T. in testing chamber, and test it according to the above cycle. 100 cycles later, leave it for 1 hour at the room temperature, then check if there is no abnormal output.

(4) 判定条件 Judging Conditions

1. 破壊しない事
Not to be broken
2. 試験後の特性は初期値から変動していない事
Characteristic to be within regulation specification after the test.

(5) 試験結果 Test Results

合格 OK

9. Voltage Dips, Short Interruptions Immunity Test (SEMI-F47)

MODEL : DRB100-24-1

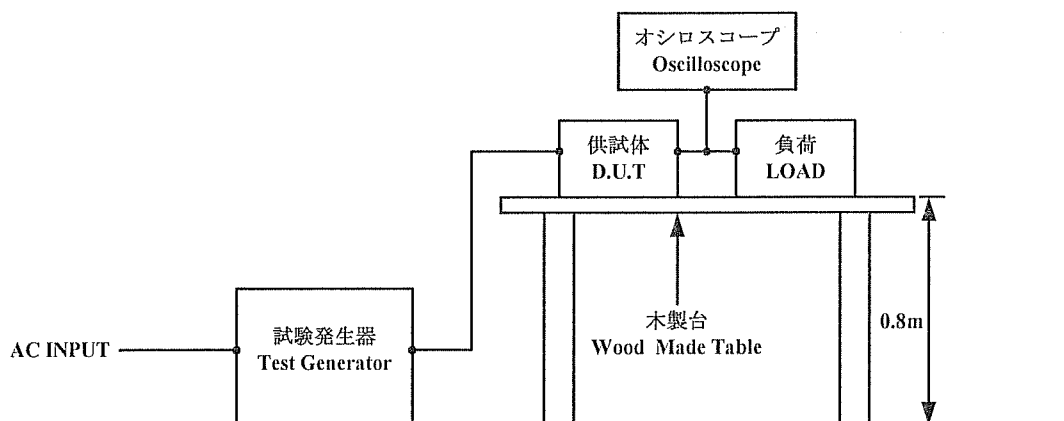
(1) 使用計測器 Equipment Used

試験発生器 : PCR2000L (KIKUSUI)
Test Generator

(2) 試験条件 Test Conditions

・入力電圧	: 200VAC	・出力電圧	: 定格
Input Voltage		Output Voltage	Rated
・出力電流	: 100%	・周囲温度	: 25°C
Output Current		Ambient Temperature	
・試験回数	: 3回	・試験間隔	: 10秒以上
Number of Tests	3 times	Test interval	More than 10 seconds

(3) 試験方法及び印加箇所 Test Method and Device Test Point



(4) 判定条件 Judging Conditions

1. 試験後の出力電圧は初期値から変動していない事。
Output voltage to be within output voltage regulation specification after the test.
2. 発煙／発火なき事。
Smoke and fire do not occur.

(5) 試験結果 Test Result

Test Level	Dip rate	Continue Time	DRB100-24-1
50%	50%	50~200ms	PASS
70%	30%	200~500ms	PASS
80%	20%	500~1000ms	PASS
50%	50%	1000ms	PASS